



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

ROBERT S. KERR ENVIRONMENTAL RESEARCH LABORATORY

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ADA, OKLAHOMA 74820

April 22, 1991

Site:	Carrier
Break:	3:30
Other:	

SUBJECT: Carrier Air Conditioning Site  
Collierville, TN

FROM: Candida West, Environmental Scientist, RSKERL *cw*  
Hugh Russell, Microbiologist, RSKERL *HR*

TO: Beth Brown, Remedial Project Manager  
North Superfund Remedial Branch  
Waste Management Division

THRU: John Matthews, Chief *JM*  
Applications and Assistance Branch

We have reviewed the outline for the soil and ground water sampling and analyses to be performed during RI Phase III at the Carrier Site in Collierville, TN and have found them to satisfy the comments we sent to you in November of 1990. It is understood that the Shelby tube soil samples to be taken for batch sorption tests will be contingent upon the results of the total organic carbon of the soil samples to be shipped to Pace Laboratories for analysis. Dr. West has requested that the total organic carbon results be called to her for evaluation when they are ready. At that time, a decision will be made concerning the Shelby tube samples.

Some comments concerning the collection of filtered water samples are appropriate. Apparently some wells have high metal levels which may be a reflection of high background levels in the county. The issue at hand is whether high levels of metals are truly representative of the ground waters and, if so, whether they represent mobile colloids that may be co-transporting metals. Typical protocol calls for filtration with 0.45 micron filters, the implication being that the filtrate represents the "truly dissolved" species. Since it has been demonstrated that colloids less than 0.45 micron in diameter are capable of mobilizing metals this obviously may not be the case. That is, the filtrate may represent a total sum equal to the dissolved portion and that associated with colloids less than 0.45 micron in diameter. The filtration protocol also implies that particles greater than 0.45 micron are not mobile, which has also been



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shown not to be the case. In summary, the proper approach to the question is (in my opinion):

- 1) Determine if there is any appreciable turbidity associated with the sample. If not, then filtration is a moot point.
- 2) If there is turbidity associated with the sample, then is it associated with improper sampling techniques? It has recently been determined that bailing a well causes turbidity, due to the suction created when the sample is lifted. Also, pumping at high flowrates can cause well disturbance, introducing particulates to the samples. One way to ascertain this is to determine if the turbidity is a function of the flowrate.
- 3) If there is turbidity and it appears to be truly representative of the aquifer water (and thus indicates that there are mobile colloids that may be associated with the metals content), then it is best to collect both filtered and unfiltered samples, so that mass balances might be carried out. In this case, it might be recommended to use a 1.0 micron filter so that all potentially mobile colloids are left in the filtrate and then follow with a 0.1 micron filtration, so that the retentate can be analyzed for metals associated with colloids. Then the question as to whether the high metals are "dissolved" or if they are colloiddally-associated can be answered.

A second issue to address is the standard method stated as that being used by Pace Laboratories to analyze solid samples for total organic carbon. The method is for water samples (not soil samples) and is, therefore, inappropriate. We have a methodology that is used at our laboratory that works well for solid samples. It has the advantage of removing the volatile components that may be present (e.g. TCE or DCE) and so is appropriate for the Carrier Site. Otherwise, the values may be biased and inappropriately high total organic carbon values obtained. The method referred to is presently being re-written as a Standard Operating Procedure. If it is acceptable, I will send a copy of this method the week of April 22nd so that Pace Laboratories may use it. Otherwise, the total organic carbon values will not be of use.

If there is any other way in which we can be of help, please do not hesitate to call on us.

cc: Mark E. Bowers,  
Chemist, EnSafe